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Getting to Know Coyotes Better: The Predator Ecology Project

*Katherine Vaughn, Special Correspondent, **The PROBE***

Many times a day — as often as every 45 minutes — a chorus of coyote howls fills the air at the Predator Research Center at Millville, Utah. For somebody standing in the kennel area, the noise can reach an ear–splitting 110 decibels.

For more than 20 years now, Dr. Fred Knowlton, leader of the Ecological and Behavioral Applications Project, has been listening to that chorus. Since its inception in 1972, Knowlton has been working at the research facility, one of nine field stations of the Denver Wildlife Research Center.

Although the DWRC had been working with depredation control for decades, in 1972 it stepped up its research efforts to identify more effective ways of reducing coyote depredation on livestock. The research effort was divided into three parts: one group assessed predator damage, a second group worked on methodologies — trying to find better ways of solving problems when they occurred — and a third group pursued research on coyote biology — population dynamics, behavior, and predator–prey interactions.

Initially, the coyote biology group worked primarily in field situations, but it quickly became apparent they would need a captive facility to study coyotes under more controlled conditions.

"Too many things happen simultaneously [in the field] and you may not know whether you're reading the effects of changing prey abundance, changing coyote abundance, or different weather patterns," said Knowlton.

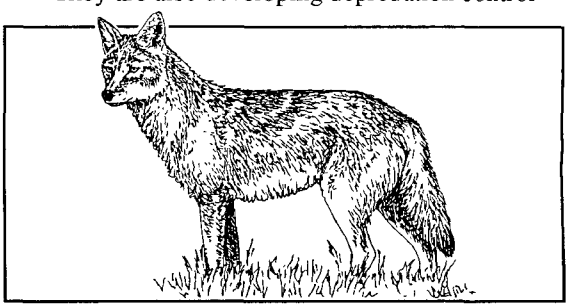
Located at the foot of the Wasatch mountains in Utah, the Millville field station boasts 80 kennels, a wet laboratory with a small medical clinic, and 34 observation pens ranging from 1/4 to 15 acres in size. Millville is an ideal location because it is close to public lands, where many coyote conflicts occur, and it is also close to Utah State University, with which the Project has a cooperative research agreement. Knowlton, in fact, holds an associate professorship in the university's College of Natural Resources.

Ideas for research at the facility frequently originate with field observations. After analyzing their field data and notes, the Millville team tries to identify potential explanations for the events and apparent relationships detected. They then attempt to mimic those circumstances in the pens, where they can control many of the variables in order to get a better understanding about which factors are important.

"When we think we understand what's going on, we then go back to the wild situation to verify our interpretations," said Knowlton.

Not all of the research at Millville, however, comes from the field. Knowlton and his colleagues are also developing tools to be used in field research. For example, they are working on physiological markers — substances that, when ingested, are retained in the animal's body for varying lengths of time. These can be used in testing the effectiveness of baits containing vaccines, reproductive inhibitors, or toxicants.

They are also developing depredation control



devices, making them more specific to coyotes, decreasing side effects, and so forth. They even test devices for private investors — recently, a private entrepreneur developed a sheep collar containing a hot sauce that would supposedly create enough discomfort to force a coyote to break off its attack and ignore the sheep. Knowlton said this kind of experiment would be difficult to conduct in the field, because coyote population densities are very low — frequently only one animal for every two square miles.

"If you attempt this type of experiment in the field, it can be a long time before a coyote attacks your sheep," said Knowlton. "But we can get animals to attack sheep here in the pens and determine their reaction."

As it turned out, this particular device didn't work.

The coyotes attacked the sheep, and when they punctured the collar and got a taste of the hot sauce, they broke off their attack, pawed at their face, shook their heads, . . . but within half an hour most

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Book Review – "How to Start and Operate a Humane Wild Stray Cat Trapping Business"

Stephen Vantassel, NWCO Coorespondent

How to Start and Operate a Humane Wild Stray Cat Trapping Business. Douglas Valentine. 1993. pp. 1-21 (P.O. Box 448, Jamul, CA 91935).

In this booklet, Mr. Valentine has endeavored to fill an important informational void in the animal control field. He begins by describing why stray cats have become a problem. First, unaltered cats can reproduce at a staggering rate. In fact, a mating pair and their offspring can produce 600 cats in two years. Second, stray cats also carry dangerous diseases like rabies. Last, but not least, Mr. Valentine properly mentions the havoc cats wreak on the local animal population.

As any good text on animal control should, Mr. Valentine covers both the business and the control side of feline trapping. In the chapters covering running a business, one will find sound advice on basic office supplies, advertising and obtaining referrals. Mr. Valentine's suggestion of networking with Day Care Centers as potential clients for cat control could only come from one experienced in the area. I also strongly concurred with his warning about the limited effectiveness of newspaper advertising because people don't look there for cat control.

Rounding out his business advice, Mr. Valentine suggests that additional income can be earned through trap rentals. He correctly advises that a written agreement can be signed detailing costs and security deposits. However, he neglects to warn the reader about potential liability about renting traps to people.

On the trapping side of cat control, Mr. Valentine is brief as well. Regarding equipment, Mr. Valentine suggests a truck with cap, 24-ft. aluminum extension ladder, and box traps with dimensions of 9x9x24" (single door). Other suggested equipment includes thick leather gloves, a ketch-pole, padlocks, and burlap bags to cover a trap in case you catch a skunk. For reasons unknown, the author does not suggest purchasing a cat grasper. A cat grasper is like snake tongs except the jaws are designed to fit around a cat's neck securely and humanely. They come in 28" length and 38" length which sell for $75.00 and $85.00, respectively, plus shipping. If you would like one, you can contact

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Your contributions to *The Probe* are welcome. Please send news clippings, new techniques, publications, and meeting notices to *The Probe*, c/o Hopland Research & Extension Center, 4070 University Road, Hopland, CA 95449. If you prefer to FAX material, our FAX number is (707) 744-1040. The deadline for submitting material is the 15th of each month. Opinions expressed in this newsletter are not necessarily those of NADCA.

CALENDAR OF UPCOMING EVENTS

July 16-21, 1995: 10th International Conference on Bear Research and Management. University of Alaska, Fairbanks, AK. Contact: Harry Reynolds, AK Dept. of Fish & Game, 1300 College Road, Fairbanks, AK 99701-1599. Telephone (907) 452-1531. FAX (907) 452-6410.

August 1-3, 1995: Bird Strike Committee—USA 1995. Dallas-Ft. Worth, Texas. Contact: James E. Forbes, USDA/APHIS/ADC, P.O. Box 97, Albany, NY 12201-0097. Telephone (518) 431-4190.

August 8-10, 1995: Symposium on Repellents in Wildlife Management, Sheraton Hotel, Denver Tech Center, Denver, Colorado. Call for papers on following topics: *Characteristics of Repellency, Bird and Mammal Repellents, Sensory and Feeding Repellents, Conservation Use Applications, Requirements for New Products*, and *Future Research Needs*. Contact: Office of Conference Services, Colorado State University, Fort Collins, CO 80523. Telephone (303) 491-7501 or FAX (303) 491-0667.

October 8-11, 1995: Annual Conference of The Society for Vector Control, Holiday Inn University Park, Fort Collins, Colorado. Contact: Justine Keller, P.O. Box 87, Santa Ana, CA 92702, Telephone (714) 971-2421, FAX (714) 971-3940.

November 5-8, 1995: Seventh Eastern Wildlife Damage Management Conference, Holiday Inn North, Jackson, Mississippi. Contact: Phil Mastrangelo, USDA/APHIS/ADC, P.O. Drawer FW, Room 200, Forest Resources Bldg., Mississippi State University, Mississippi State, MS 39762. ***NADCA Annual Meeting will be held in conjunction with this Conference.***

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Book Report. . .

Animal Management Inc. at 1-800-745-8173. They are also sold by other animal control supply distributors.

His discussion on the technique of trapping cats is incredibly brief. Perhaps his brevity comes from believing that cats are easy to catch. He simply says that traps should be set near feeding or denning areas. For bait, just use 3 oz. cans of fish-flavored cat food with pull top covers for added convenience. He also advises that traps be set out of public view (whenever possible) and chain the traps if theft is a possibility. Like all trappers, Mr. Valentine advises using multiple traps to finish a job. He concludes the booklet by listing a number of books and magazines useful to learning about animal damage control. However, none of the listings would surprise any reader of the major animal control trade magazines. What puzzles this reviewer is why the author includes a pigeon trap manufacturer and books on animal damage control. It appears that Mr. Valentine does not think that cat control alone can pay all the bills.

The problem with this booklet lies not so much on what it says but on what it doesn't. He opens topics but then neglects to fully flesh them out for the reader. For example, despite his contention that cats are easy to catch, he mentions that a two-door trap may be necessary when a cat won't go into a one-door trap. However, he doesn't provide the suggested dimensions of that two-door trap. Second, he warns the reader that cats are private property and that one should check for collars or tags. The problem is that some owners tattoo their cats because many cats don't like collars. Mr. Valentine offers no suggestions on how to check a caged cat for tattoos. Finally, Mr. Valentine properly warns readers to be prepared in case one catches a skunk. But again he neglects to answer the obvious question of whether there are any baits more selective in catching cats than fish. I myself was wondering if catnip might be a possibility.

In his defense, it must be noted that there wasn't a great deal of room for lengthy descriptions because the book is only twenty-one 8-1/2x11 inch pages long. However, room was available to at least begin to flesh out these important issues had he decided to reduce the amount of white space. Another important oversight in this booklet was his failure to include even basic information or resources on cat biology and habits. In light of this level of brevity, it should come as little surprise that the text also lacks the inclusion of one illustration or diagram.

In conclusion, where Mr. Valentine gives advice he has provided some useful information to get your cat control business up and running with less down time. However, should you encounter any real difficult problems like public relations or catching a trap wise cat, the advice is not available. In short, this text is only the first baby step of a much needed further book dealing with this aspect of animal control.

Stephen Vantassel, NWCO Correspondent, 332A Cooley Street, Box 102, Springfield, MA 01128, E-mail ADCTRAPPER@aol.com

ADC News, Tips, Ideas, Publications . . .

Finally—A Solution to Bird Problems

A food grade ingredient well known to us from the grape-flavored bubble gum and some perfumes has found still another use. The chemical, methyl anthranilate (MA), which is found in concord grapes, has the unique ability to repel birds.

The fact that birds dislike the taste of methyl anthranilate has been known to scientists for at least 30 years. The discovery came from the observation that birds avoided concord grapes. Further study determined that the protection came from a natural form of methyl anthranilate found in concord grapes. While this has no effect on mammals, birds perceive the taste of MA comparable to humans biting into a hot chili pepper.

Putting this knowledge to work, Dr. Peter Vogt and his colleagues at PMC Specialties Group, Inc., in Cincinnati, Ohio, developed *ReJex-It* Bird Aversion Agents based on MA as an active ingredient. These agents were developed using all food grade ingredients and have the unique abilities to repel birds, and at the same time are safe for birds, humans, and mammals. They are completely biodegradable in the environment. *ReJex-It* products function via aversion rather than by toxicity, and are a few of the first products to meet the U.S. EPA's criteria for "reduced risk" presenting minimal risk to applicators, targets, people. pets, and wildlife. That these products repel birds is no questi· n. As of March 1995, *ReJex-It* products are approved for use on turf and landfills in all but few states. Studies are presently done to expand the uses of these bird aversion agents to solve the bird problems with roosting birds and crop damage to small fruits and berries.

For more information, interested readers are welcomed to call local distributors of these products. Just in Time Chemical Sales & Marketing, Inc. is a proud distributor on the East Coast and readers are welcome to call me at 1-800-401-0880. However, there are also a few fine distributors on the West Coast. Lloyd Barker Dist., Kirkland, Washington (206) 828-9890; Environmental Turf, (206) 488-8516; and, Tom Irwin Dist., 1-800-582-5959. For additional distributors and information, call Dr. Peter Vogt at RJ Advantage, a subsidiary of PMC Specialties Group, 1-800-HAD-BIRD.

Stan Jak, President,
Just In Time Chemical Sales & Marketing Inc.

The editors of **The PROBE** *thank contributors to this issue: Stan Jak, Stephen Vantassel, , James E. Forbes, and Wes Jones. Send your contributions to* **The PROBE**, *4070 University Road, Hopland, CA 95449.*

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Getting to Know Coyotes Better

of them were attacking the sheep again, this time avoiding the neck," said Knowlton.

This result was not surprising for Knowlton and his colleagues, who know that coyotes are very versatile and quick to learn.

"Anyone working with coyotes becomes acutely aware of how quickly they pick up cues and respond to them," said Knowlton.

"We frequently refer to them as single–trial learners. They only need one experience and they make their adjustments," he said, adding that while their intelligence makes them both interesting and enjoyable to work with, that doesn't mean they're *easy* research subjects.

"If you work with them very much, sooner or later you will violate their rules, and they will retaliate. Most of us that work with them for any length of time have little white scars on our hands and fingers to attest that we have violated their rules," said Knowlton with a chuckle.

To conduct their research, the Millville crew uses both coyotes reared by hand and ones reared by their mothers. They frequently prefer to use hand–reared coyotes because their behavior is actually more "natural."

"The hand–reared ones can tell when you aren't going to pay attention to them," said Knowlton. "They'll learn to ignore you and go about doing the things they want to do, whereas the parent–reared ones never forget you're there — they never take you out of the equation."

Knowlton admits that using captive animals may change the frequency of certain behaviors, but he stresses that the relationships among the behaviors and the variables are probably on target. This is because the behaviors that he and his colleagues are most interested in are more apt to be "locked in" genetically — instinctive. They're the ones that the animal cannot ignore, and thus are the least apt to change. An example of such deeply–ingrained behavior is when coyotes try to cache extra food by digging a hole and burying it.

"We've seen pups that were five or six weeks old — they're still unsteady on their feet — but when we've given them too much to eat, we've watched them go through the motions. They were clumsy, but we could recognize the food–caching motions," said Knowlton.

The researchers are interested in what coyotes respond to and how they learn, with the ultimate goal of trying to understand coyotes better so they can find ways to change their behavior. The Millville team is "looking for the chinks in their armor," Knowlton said.

An example of one of these "chinks" is the relationship between livestock depredation and the provisioning of pups. When coyotes have pups to feed, they are more apt to kill sheep. Knowlton and his colleagues were able to demonstrate that if you remove the pups and leave the adults, livestock killing frequently stops. They are now looking into sterilization of adult coyotes as a way of preventing depredation. Knowlton and his colleagues need to determine whether sterilized animals would maintain their territories, their pair bonds, and their population densities.

"It could be that densities change and offset whatever you did. Several things have to be looked at in concert," he said.

"We have done some of the background work, and I expect that in the near future we will be field testing the concept," said Knowlton, adding that if it works out, they'll probably use immunocontraception, which can be almost species–specific, only affecting coyotes.

Sterilization — as opposed to elimination of the coyotes — is part of a general movement in the field of wildlife damage management toward finding non–lethal means of controlling livestock depredation. Over the past few years, Knowlton has seen more interest in frightening devices, repellents, and guard animals such as dogs and llamas. In fact, the predator ecology project will soon be conducting research on llamas, which have gained increasing popularity as sheep guardians.

For the moment, many of the project's efforts are in the pens, which consist of cleverly–designed central observation buildings surrounded by teardrop–shaped fenced areas. One–way windows allow researchers to watch the coyotes discreetly, while den boxes imbedded in the sides of the buildings offer access to pups through removable top panels. Having three pens attached to a central building prevents coyotes from being agitated by observers moving from one pen to another. The teardrop shape of the pens keeps coyotes from cornering each other and fighting, while allowing the animals a fair amount of space to move around. Millville currently has three such observation posts, and they're in the process of building six more.

The Millville station has larger pens, but it is difficult to handle coyotes with so much space. Knowlton said that in one 15-acre pen they attempted to study the effects of group size on reproduction and territoriality, but the study was not very successful.

"We tried to get two pairs of coyotes to establish territories so we could look at territorial arrangements, but the pens were too small," said Knowlton. "One pair dominated. They had the use of 99% of the pen and the other ones were restricted to one small corner."

Knowlton said that within the next six or eight months the predator ecology project will be starting some three–year field studies. Work will continue at the Millville station, of course, and Knowlton said that they will soon have some new neighbors. Utah State University has bought adjoining land with the intention of consolidating all of its wild animal research there. Let's hope the new researchers wear earplugs — unless they want to join the coyote chorus.

CNWOA First Affilliate Chapter of NADCA

The Connecticut Nuisance Wildlife Control Operators Association (CNWOA) is the first Affiliate Chapter of NADCA.

The official announcement was made at the March 7th Connecticut NWCO Association meeting in West Hartford,Connecticut, by NADCA President James E. Forbes and Regional Director Laura Henze. NADCA Membership Committee Member Don Wilda also attended.

The organization officers are Richard Daniott Jr., President; Dennis Devlin, Vice President; Erik W. Shaffer, Secretary; and Paul Magnotta, Treasurer.

Other Charter Members of the Affiliate Chapter who are also NADCA members include: Fred Jones, Douglas Moorcroft, John Pitts, Preston C. Pope, Charles Pucilauskas, Robert Schmidt, Arthur J. Taylor, Stephen Vantassel, and Ronald Yanac.

This organization maintains a good working relationship with the Connecticut Department of Environmental Protection, Wildlife Division, as evidenced by the attendance of wildlife biologist Mark N. Clavette and wildlife technician Chris Vann.

The meeting was interesting and informative. The evening was topped off by a round of several kinds of pizza, which everyone enjoyed.

NADCA welcomes our new affiliate and wish them the best of luck in the future.

NADCA Annual Meeting to be Held in Mississippi

The Annual Membership Meeting of NADCA will be held in Jackson, Mississippi in conjunction with the 7th Eastern Wildlife Conference (Nov. 5-8, 1995), according to President Jim Forbes. This meeting is an opportunity for all members to get together to discuss NADCA and to conduct business of the organization. The exact date and time of the meeting will be announced at a later time. For information on the Conference, see the listing in the "Calendar of Upcoming Events." To submit agenda items for the meeting, contact Jim Forbes.

Trapping Weasels

James Forbes, NADCA President

If you look at the logo on the first page of your 1995 NADCA Membership Directory, you will notice that one of the starlings is missing (who says your President doesn't notice details?). That's him, the third one that usually flies above the "D" and "C"!

Contrary to popular belief, that bird did not get himself into one of my weasel traps. Most likely, the starling is gone because it was involved in an aircraft-bird strike at an airport. Maybe a big airport like Chicago's O'Hare. Speaking of O'Hare Airport, I was out that way in February.

The occasion was the First Annual Wildlife Control Instructional Seminar held at Nordic Hills Resort and Conference Center, Itasca, Illinois. The seminar was sponsored jointly by *Wildlife Control Technology (WCT) Magazine* and NADCA.

The NADCA Continuing Education Committee, co-chaired by Scott Craven and Terry Salmon, provided many of the speakers. The seminar was organized by Robert J. Erickson and Bob Noonan of WCT and both NADCA members.

The keynote address was given by **The PROBE** editor Robert H. Schmidt. The other speakers included Guy Connolly, Richard Daniotti, Jim Kruise, Jim Forbes, Scott Craven, and Charles Dobbins, all of whom are NADCA members.

The topics covered included the USDA-ADC research program, raccoons, muskrats, squirrels, urban geese, wildlife diseases, snakes (excellent talk by Scott Craven), bats, urban birds, beaver, skunks, and euthanasia techniques, to name a few.

Of particular interest was a talk on wildlife control in Germany by Carsten Bothe, a state wildlife biologist from Braunschwerg, Germany. Imagine doing ADC work in a country that has 227 Germans/square kilometer. They remove 70,000 stone marten (a species the size of a cat that lives only in homes) each year using enormous killer traps which exert 250 pounds of pressure on each of two springs.

Early in this century, the North American muskrat was introduced into Germany and caused thousands of dollars damage each year. The country employs 35 government trappers to supervise 3500 private trappers to control muskrats. Each trapper gets $2.00 per pelt and a $5.00 bounty for a muskrat tail tip. Incidentally, if you would like to read more about ADC in Germany, Mr. Bothe has an article on German fox traps in the March 1995 issue of *Fur-Fish-Game Magazine* (see page 33).

At the seminar, the 8:00 a.m. to 8:00 p.m. twelve-hour days were long, but no one seemed to mind. The food was good and the accommodations were great. If you missed it, you missed a good one, but don't worry—they plan to do it again next year.

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